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(54) SOLVENT-CONTAINING PAINT OR LACQUER COMPOSITIONS

(71) We, HERBERTS GMBH, of 25 Christbusch, D-5600 Wuppertal 2, Federal Republic of Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to solvent containing paint or lacquer compositions.

Quick-drying paint or lacquer compositions contain relatively volatile solvents which have a low flash point. Generally the flash point of the composition is even lower than that of the solvent mixture contained in it. Due to the low flash point of such compositions which may be classified by the "danger class AI" considerable restrictions are placed on the storage or the construction of stores for the compositions, thus increasing the expense of their storage.

If the low-boiling solvents having a low flash point, such as isobutyl acetate, methyl ethyl ketone or toluene, are replaced by solvents having a higher flash-point, such as xylene or n-butyl acetate, the drying time is increased considerably. Consequently, in some cases painting of vertical surface is only conditionally possible. In the case of compositions for marking roads, the time for which the traffic is obstructed by marking work is prolonged considerably and, in the case of marking on black surfaces, discolouration may occur as a result of the road surface dissolving and causing the colours to run.

The present invention provides a solvent-containing paint or lacquer composition wherein the solvent comprises a total of at least 50 percent by weight of isobutyl acetate and/or toluene or a mixture thereof, and up to 35 percent by weight 1,1,2 - trichloro - trifluoroethane based on the total weight of the solvent, the solvent-containing paint or lacquer composition having a flash point of at least 21°C.

The compositions according to the invention have the advantage that they are generally quick-drying and will have an elevated flash-point as compared to previously used compositions, preferably having a flash-point of at least 26°C. The composition usually also comprises an organic solvent. The halohydrocarbon added in accordance with the invention generally only acts as an extender or diluent. It cannot replace true solvents for the binder container in the compositions.

The content of the 1,1,2 - trichlorotrifluoroethane is not more than 35% by weight based on the total weight of the solvent. Higher contents of this compound, and also large quantities of extenders, can cause the paint to become unstable. The use of trichloro-trifluoroethane does not unduly accelerate the drying and it is also physiologically tolerable.

The invention also provides a diluent which may be used for paint or lacquer compositions according to the invention, which comprises at least 50 percent by weight of isobutyl acetate or toluene or a mixture thereof and up to 35 percent by weight of 1,1,2 - trichloro-trifluoroethane, based on the total weight of the diluent, the diluent having a flash point of at least 21°C. The diluent may include other components such as isopropanol, preferably in small quantities.

The quantity of 1,1,2 - trichloro-trifluoroethane necessary for the desired increase of the flash point can be determined by a preliminary test in each case. To increase the flash point sufficiently it is usually necessary to have a higher content of the compound in the finished coating composition than in diluents for example the diluents preferably contain only up to 25% trichloro-trifluoroethane by weight.

The following Examples illustrate the invention.

EXAMPLE 1

100 Parts of a paint composition based on acrylic resin contain 37 parts by weight of the following mixture:

23 parts by weight of toluene
2 parts by weight of isobutylacetate, 85% strength
12 parts by weight of 1,1,2 - trichloro-trifluoroethane
37 parts by weight

Flash point of the paint: >26°C
Drying time at 20°C: approximately 10 minutes in the case of a wet film 300 μm thick.

If the 1,1,2 - trichloro-trifluoroethane is replaced by toluene the flash point drops to less than 20°C.

If the solvent mixture is replaced by a relatively non-volatile mixture of n-butyl acetate and xylene, the drying time is increased to approximately 30 minutes.

EXAMPLE 2

A paint composition based on PVC contains 50.7 parts by weight of the following solvent mixture per 100 parts by weight of the paint composition:

16 parts by weight of toluene
20.7 parts by weight of isobutyl acetate, 85% strength
14.0 parts by weight of 1,1,2 - trichloro-trifluoroethane

Flash point of the paint >26°C
Drying time at 20°C: approximately 10 minutes in the case of a wet film 300 μm thick.

EXAMPLE 3

100 Parts of a nitrocombination lacquer (i.e. based on nitrocellulose) contains 60 parts by weight of the following solvent mixture:

30 parts by weight of isobutyl acetate, 85% strength
15 parts by weight of toluene
15 parts by weight of 1,1,2 - trichloro-trifluoroethane

Flash point >26°C.

EXAMPLE 4

100 Parts of a hammer blow lacquer based on nitrocellulose contains 70 parts by weight of the following solvent mixture:

35 parts by weight of isobutyl acetate 85% strength
10 parts by weight of isopropanol
5 parts by weight of toluene
20 parts by weight of 1,1,2 - trichloro-trifluoroethane

Flash point >26°C.

EXAMPLE 5

A universal diluent consists of:

35 parts by weight of isobutyl acetate, 85% strength
25 parts by weight of isopropanol
20 parts by weight of toluene
20 parts by weight of 1,1,2 - trichloro-trifluoroethane

Flash point >26°C.

EXAMPLE 6

A diluent for the paint composition described in Example 2 consists of:

39 parts by weight of toluene
41 parts by weight of isobutyl acetate 85% strength
20 parts by weight of 1,1,2 - trichloro-trifluoroethane

Flash point >26°C.

WHAT WE CLAIM IS:—

1. A solvent-containing paint or lacquer composition wherein the solvent comprises a total of at least 50 percent by weight of isobutyl acetate or toluene or a mixture thereof, and up to 35 percent by weight of 1,1,2 - trichloro-trifluoroethane based on the total weight of the solvent, the solvent-containing paint or lacquer composition having a flash point of at least 21°C.

2. A composition as claimed in claim 1, wherein the solvent includes isopropanol.

3. A composition as claimed in claim 1 or claim 2 which includes nitrocellulose or polyvinyl chloride.

4. A composition as claimed in any one of claims 1 to 3 which is a quick-drying composition.

5. A composition as claimed in claim 4, wherein the drying time of a 300 μm thick film of the composition is not more than 20 minutes at 20°C.

6. A composition as claimed in claim 5, wherein the said drying time is not more than 10 minutes.

7. A composition as claimed in any one of claims 1 to 6, which has a flash-point of at least 26°C.

8. A solvent-containing paint or lacquer composition substantially as hereinbefore described in any one of Examples 1 to 4.

9. A diluent for a composition as defined in any one of claims 1 to 8, which comprises at least 50 percent by weight of isobutyl acetate or toluene or a mixture thereof and up to 35 percent by weight of 1,1,2 - trichloro-tri-fluoroethane, based on the total weight of the diluent, the diluent having a flash point of at least 21°C.

10. A diluent as claimed in claim 9, which comprises not more than 25 percent by

weight of trichloro-trifluoroethane based on the total weight of the diluent.

11. A diluent as claimed in claim 9 or claim 10, which includes isopropanol.

12. A material or article which has been coated with a composition as defined in any one of claims 1 to 8.

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